

REMARKS

The Official Action dated October 13, 2004, has been carefully considered. Consideration of the changes and remarks presented herein and reconsideration of the rejections are therefore respectfully requested. Applicants wish to thank the Examiner for his indication of allowance of claim 21. Claim 25 has been added. It is believed that these changes do not involve any introduction of new matter, and thereby entry is believed to be in order and is respectfully requested. Claims 12-25 remain in the application for consideration.

In the Official Action, the Examiner noted that copies of two references listed in the Form PTO-1449 were not provided and therefore not considered. Applicants now provide a copy of reference WO00/04430, which is the published application for priority document EP Application No. 98305761 the other document referenced by the Examiner. As such, Applicants respectfully request the Examiner to consider these references and provide an indication that they have been properly considered. A duplicate copy of the previously filed form PTO-1449 is provided.

In the Official Action, claims 12-15, 20 and 22 were rejected under 35 U.S.C. §103(a) as being unpatentable over the Nakamura et al. U.S. Patent No. 5,998,953 (hereinafter referred to as "Nakamura et al") in view of the Soupert et al U.S. Patent No. 5,341,540 (hereinafter referred to as "Soupert et al"). The Examiner asserted that Nakamura et al. illustrate by way of FIG. 4 a power supply (a battery); a traction mechanism (left and right driving wheels); dispense mechanism to deposit fluent (a pump); plurality of navigation sensors (distance detect devices, gyro sensor, distance measurement sensor); at least one deposition detector (a liquid detection sensor); and a control system (a work unit CPU). The Examiner also stated that Nakamura et al. disclose using a sensor to detect obstacles in the environment around the robot and a liquid detection sensor to detect liquid dispensed on the

surface. Moreover, the Examiner asserted that Nakamura et al. illustrate a traction mechanism having left and right traction motors. Finally, the Examiner stated that Nakamura et al. teach via FIG. 4 functions to treat floor coverings in an autonomous manner and senses and controls dispensing of fluent material on the floor covering. The Examiner also noted that Soupert et al illustrate that it was well known in the self-propelled robot art at the time of the Applicants' invention to provide sensors on the robot to detect obstacles and to provide programming to carry out avoidance procedures.

However, as will be set forth in detail below, it is submitted that the self-propelled robots and methods for using the same as defined by claims 12-15, 20 and 22, are nonobvious and patentable over Nakamura et al. in view of Soupert et al. Accordingly, this rejection is traversed and reconsideration is respectfully requested.

As defined by claim 12, from which claims 13-20 and 22-24 depend, the present invention is directed toward a self-propelled robot configured for movement over a trackless surface. The robot includes a power supply, a traction mechanism, a dispense mechanism, a plurality of navigation sensors, one or more deposition detectors and a control system. The traction mechanism is configured to receive power from the power supply and move the robot over a trackless surface. The dispense mechanism is adapted to controllably deposit a fluent material onto the trackless surface. The navigation sensors provide signals for enabling the robot to navigate over the trackless surface and around obstacles thereon. The one or more deposition detectors are adapted to detect the presence of the fluent material on the trackless surface and provide signals indicative thereof. Finally, the control system is configured to receive the signals from the navigation sensors and the one or more deposition detectors and is operably dependent upon the signals to control the traction and dispense mechanisms.

Nakamura et al. disclose a mobile apparatus (robot) utilized in applying wax to a

surface which can determine the maximum time before another coat of wax is to be applied before degradation is identified (abstract). The mobile apparatus includes a body for carrying out a predetermined work while moving, a first set unit for setting a time between the body carrying out the work on the common area of first and second regions and the next work on that area, and a second set unit for setting a travel path of the mobile work apparatus according to the time set by the first set unit (col. 2, lines 16-22). The travel path of the robot is automatically determined as a result of the user entering the horizontal length and vertical length of the work region, such that a zigzag travel can be carried out by the robot on the work region (col. 4, lines 56-60).

Soupert et al. disclose an autonomous apparatus for cleaning ground areas and a control mechanism for directing the apparatus along a prescribed path over a preselected area to be cleaned (abstract).

The Nakamura et al. reference teaches that its disclosed mobile apparatus moves in a zigzag direction to prevent a second coat of wax from being applied to the surface until the first coat of wax has sufficiently dried. References relied upon to support a rejection under 35 U.S.C. §103 must provide an enabling disclosure, i.e., they must place the claimed invention in the possession of the public, *In re Payne*, 203 U.S.P.Q. 245 (CCPA 1979). Nakamura et al. fail to teach or suggest a robot that controls the dispensing of cleaning material based on whether the apparatus detects a previous application of such cleaning material. Nakamura et al. simply teaches providing a path such that enough time passes so that the wax dries before applying additional coats. The failures of Nakamura et al. are not remedied by the combination with Soupert et al. In view of the failure of Nakamura et al. and Soupert et al. to teach or suggest a method for using a self-propelled robot having one or more deposition detectors adapted to detect the presence of the fluent material in the trackless

surface and provide signals indicative thereof and a control system configured to receive the signals from the deposition detectors which is operably dependent upon the signals to control the dispenser mechanism, as defined in claim 12, Nakamura et al. and Soupert et al. do not support a rejection of claim 12 under 35 U.S.C. § 103. Applicants therefore submit that the 35 U.S.C. § 103 rejection of the presently claimed method of using the self-propelled robot of claim 12 and claims 13-15, 20 and 22 over Nakamura et al. in view of Soupert et al. has been overcome. Reconsideration is respectfully requested.

It is therefore submitted, that the presently claimed self-propelled robots are nonobvious over Nakamura et al. in view of Soupert et al., whereby the rejection under 35 U.S.C. §103 has been overcome. Reconsideration is respectfully requested.

Claim 23 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Nakamura et al. in view of Soupert et al. and the Nakanishi U.S. Patent No. 5,815,880 (hereinafter referred to as "Nakanishi"). The Examiner asserted the teachings of Nakamura et al. show using wax as the deposited material to wax floor surfaces. Moreover, the Examiner alleged that it would have been obvious to one skilled in the art to readily apply the teachings of Nakamura et al. to other types of treatable surfaces. The Examiner also asserted that Nakanishi teaches an autonomous cleaning robot which may include dispensing fluids such as detergents, disinfectant and waxing solution whereby the type of fluid dispensed would have been a function of the treatable surface. As such, the Examiner contended that one having ordinary skill in the art would have found it obvious to modify the robot of Nakamura et al. to dispense other fluent materials.

However, Applicants submit that the method of using the self-propelled robot as set forth in claim 23, is nonobvious over Nakamura et al. in view of Soupert et al. and Nakanishi. Accordingly, this rejection is traversed and reconsideration is respectfully requested.

Claim 23 depends from claim 12. The deficiencies of Nakamura et al. and Soupert et al. with respect to claim 12 are discussed above. Nakanishi does not resolve these deficiencies as Applicants found no teaching or suggestion by Nakanishi of a self-propelled robot as claimed and particularly having one or more deposition detectors adapted to detect the presence of the fluent material in the trackless surface and provide signals indicative thereof and a control system configured to receive the signals from the deposition detectors which is operably dependent upon the signals to control the dispenser mechanism as recited in claim 12, and therefore in claim 23.

The failures of Nakamura et al. and Soupert et al. are not remedied by the combination with Nakanishi. In view of the failure of Nakamura et al., Soupert et al. and Nakanishi to teach or suggest a method for using a self-propelled robot having one or more deposition detectors adapted to detect the presence of the fluent material in the trackless surface and provide signals indicative thereof and a control system configured to receive the signals from the deposition detectors which is operably dependent upon the signals to control the dispenser mechanism as defined in claim 23, Nakamura et al., Soupert et al. and Nakanishi do not support a rejection of claim 23 under 35 U.S.C. § 103. Applicants therefore submit that the 35 U.S.C. § 103 rejection of the presently claimed method of using the self-propelled robot of claim 23 over Nakamura et al. in view of Soupert et al. and Nakanishi has been overcome. Reconsideration is respectfully requested.

Claim 24 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Nakamura et al. in view of Soupert et al. and the Azumi et al. U.S. Patent No. 5,622,236 (hereinafter referred to as "Azumi et al"). The Examiner once again asserted the teachings of Nakamura et al. and Soupert et al. Moreover, the Examiner alleged that it would have been obvious to one skilled in the art to readily apply the teachings of Nakamura et al. such that other means

of detecting deposited material could be used in conjunction with the robot. The Examiner also asserted that Azumi et al. teach mixing a luminous material with the dispensed material to aid the robot in performing its cleaning function. As such, the Examiner contended that one having ordinary skill in the art would have found it obvious to use alternative means of detecting the dispensed material in the robot of Nakamura et al. such that the luminous material would have enabled the robot of Nakamura et al. to detect the dispensed material.

However, Applicants submit that the method of using the self-propelled robot as set forth in claim 24, is nonobvious over Nakamura et al. in view of Soupert et al. and Azumi et al. Accordingly, this rejection is traversed and reconsideration is respectfully requested.

Claim 24 depends from claim 12. The deficiencies of Nakamura et al. and Soupert et al. with respect to claim 12 are discussed above. Azumi et al. do not resolve these deficiencies as Applicants found no teaching or suggestion by Azumi et al. of a self-propelled robot having one or more deposition detectors adapted to detect the presence of the fluent material in the trackless surface and provide signals indicative thereof and a control system configured to receive the signals from the deposition detectors which is operably dependent upon the signals to control the dispenser mechanism as recited in claim 12, and therefore in claim 24. The failures of Nakamura et al. and Soupert et al. are not remedied by the combination with Azumi et al. In view of the failure of Nakamura et al., Soupert et al. and Azumi et al. to teach or suggest a method for using a self-propelled robot as defined in claim 24, Nakamura et al., Soupert et al. and Azumi et al. do not support a rejection under 35 U.S.C. § 103. Applicants therefore submit that the 35 U.S.C. § 103 rejection of the method of using the self-propelled robot of claim 24 over Nakamura et al. in view of Soupert et al. and Azumi et al. has been overcome. Reconsideration is respectfully requested.

Claims 16-19 were rejected under 35 U.S.C. § 103(a) as being unpatentable over

Nakamura et al. in view of Soupert et al. and Sekiguchi et al., "A Mobile Robot by Multi-Hierarchical Neural Network," IEEE, Conf. on Robotics and Automation, May 1989, vol. 3, pp. 1578-83 (hereinafter referred to as "Sekiguchi et al"). Once again, the Examiner asserted the teachings of Nakamura et al and Soupert et al. The Examiner also asserted that Sekiguchi et al. teach multi-hierarchical neural networks are used to process input information and to adapt the operation of a robot to its environment. As such, the Examiner contended that one having ordinary skill in the art would have found it obvious to apply the teaching of Sekiguchi to the robot of Nakamura et al. because it would have provided a control structure in which the robot could readily adapt its operation to its changing environment.

However, Applicants submit that the self-propelled robots set forth in claims 16-19 are nonobvious over Nakamura et al. in view of Soupert et al. and Sekiguchi et al. Accordingly, this rejection is traversed and reconsideration is respectfully requested.


Claims 16-19 depend from claim 12. As previously noted, the deficiencies of Nakamura et al. and Soupert et al. with respect to claim 12 are discussed above. Sekiguchi et al. do not resolve these deficiencies as Applicants found no teaching or suggestion by Sekiguchi et al. of a self-propelled robot configured having one or more deposition detectors adapted to detect the presence of the fluent material in the trackless surface and provide signals indicative thereof and a control system configured to receive the signals from the deposition detectors which is operably dependent upon the signals to control the dispenser mechanism as recited in claim 12, and therefore in claims 16-19. The failures of Nakamura et al. and Soupert et al. are once again not remedied by the combination with Sekiguchi et al. In view of the failure of Nakamura et al., Soupert et al. and Sekiguchi et al. to teach or suggest of a self-propelled robot as defined in claim 12, Nakamura et al., Soupert et al. and Sekiguchi et al. do not support a rejection under 35 U.S.C. § 103. Applicants therefore

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submit that the 35 U.S.C. § 103 rejection of the self-propelled robot of claims 16-19 over Nakamura et al. in view of Sekiguchi has been overcome. Reconsideration is respectfully requested.

It is believed that the above amendments and remarks represent a complete response to the Examiner's rejections under 35 U.S.C. § 103, and as such, place the present application having claims 12-25 in condition for allowance. In the event that the present application is not in condition for allowance, entry of the present amendment for purposes of appeal is requested. Reconsideration and an early allowance are requested.

Respectfully submitted,



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